

Viral Hemorrhagic Fevers

REPORT IMMEDIATELY

Section 1:

ABOUT THE DISEASE

A. Etiologic Agent

Viral hemorrhagic fevers (VHFs) include numerous zoonotic diseases caused by different viruses, all of which result in a hemorrhagic syndrome in humans. VHFs are known to be caused by filoviruses, arenaviruses, bunyaviruses, and flaviviruses. Some specific VHFs are Ebola, Marburg, Lassa, Junin (Argentine VHF), Machupo (Bolivian VHF), Sabia (Brazilian VHF), Guanarito (Venezuelan VHF), Crimean Congo hemorrhagic, and Rift Valley fevers.

B. Clinical Description

The onset of VHF is usually sudden. The duration of illness can vary from a few days to a couple of weeks. Patients may present with a brief prodrome characterized by nonspecific symptoms, including fever, headache, malaise, weakness, irritability, dizziness, muscle aches, nausea, and vomiting. As the illness progresses, symptoms may include low blood pressure, sustained fever, sweats, rash, diarrhea, flushing, swelling around the eyes, and redness of the eyes. The patient may become prostrate and may develop pain in the throat, chest, or abdomen, as well as petechiae and ecchymoses (bruises). In severe cases, the patient may bleed from mucous membranes (including the nose and gums) and may develop hematemesis (bloody vomit), hematuria (bloody urine), bloody stools, and bloody sputum. As a result of the profound blood loss, the patient will often go into shock. Encephalopathy, hepatitis, intention tremors, and reduced white blood cell and platelet counts are frequently seen; renal failure may also occur. The severity of clinical disease varies depending on the agent causing the illness and can range from unapparent to fatal. Mortality rates following development of clinical disease also vary depending on the agent and the strain; rates range from 10–90%.

C. Vectors and Reservoirs

Many wild and domestic animals, ticks, and mosquitoes are known to carry some of the VHF agents, although reservoirs have not been identified for all VHF agents. Rodents are known to be the carriers of Lassa, Junin, Machupo, Guanarito, Crimean Congo hemorrhagic, and Rift Valley fever viruses. Mosquitoes, ticks, and animals (including rodents, foxes, hares, and groundfeeding birds) are known to carry bunyaviruses that cause VHFs. Primates are the only mammal group known to be affected by Ebola and Marburg hemorrhagic fever viruses. However, because these infections are associated with a rapid and often fatal illness, primates are not considered to be a reservoir. Once certain VHFs establish themselves in human populations, person-to-person spread may occur.

D. Modes of Transmission

The mode of transmission of VHF in an individual case is typically animal, tick, or mosquito exposure. Once a human has acquired infection with a VHF agent, transmission may occur from person to person. Humans can become infected through contact with infectious blood or with secretions from infected persons or animals. Individuals have

acquired VHFs through sexual contact. Bedding or other objects may serve as a source of infection. Medical equipment that has not been properly cleaned or sterilized has been responsible for the spread of some VHFs, and rarely, VHFs have been acquired by laboratory workers while manipulating specimens. For most VHFs, direct physical contact with infectious blood or secretions is thought to be required for transmission. However, for some VHFs, such as some of the arenaviruses, aerosol spread is considered likely.

E. Incubation Period

The incubation periods for VHFs range from 1–21 days, with an average of 3–10 days.

F. Period of Communicability or Infectious Period

Infected individuals are generally considered to be infectious for a variable period preceding the onset of symptoms (up to about three weeks for some VHFs) and during the course of clinical symptoms. The virus may remain in the blood and in secretions for months after an individual recovers. Contaminated bedding and medical equipment may remain infectious for several days. For some VHFs, the virus may remain viable for a variable duration post-mortem, permitting transmission from recently deceased patients.

G. Epidemiology

VHFs are caused by a number of different viruses that infect wild animals, birds, mosquitoes, and ticks; taken together, VHFs are distributed over much of the globe. Individual VHFs, however, occur in different geographic regions, depending on where the host species are found, and people usually become infected only in those areas. Occasionally, a host that has been exported from its native habitat can infect people. A person can become infected in an area where a virus occurs naturally, and then by traveling elsewhere, can spread the disease from person to person. Because travel is now so common, outbreaks of these diseases are becoming threats in places where they have rarely or never been seen before.

H. Bioterrorist Potential

The viruses that cause VHFs are considered to be Category A bioterrorism agents. If acquired and properly disseminated, these viruses could cause a serious public health challenge in terms of ability to limit the number of casualties and to control other affects from such an attack.



Section 2:

REPORTING CRITERIA AND LABORATORY TESTING

A. What to Report to the Massachusetts Department of Public Health (MDPH)

Report any illness suspected by a health care provider of being a VHF. Also report any potential exposure to an agent that could cause VHF.

Note: See Section 3C for information on how to report a case.

B. Laboratory Testing Services Available

The MDPH State Laboratory Institute (SLI) does not provide diagnostic testing for VHFs. However, the SLI Virus Serology Laboratory can arrange for serum samples to be forwarded to the Centers for Disease Control and Prevention (CDC) for testing.

For additional information on testing or specimen submission, contact the SLI Virus Serology Laboratory at (617) 983-6396. Please call the laboratory prior to specimen submission.



Section 3:

REPORTING RESPONSIBILITIES AND CASE INVESTIGATION

A. Purpose of Surveillance and Reporting

- ◆ To identify potential sources of transmission which may exist in the U.S. (such as non-human primates [NHPs] or laboratory specimens).
- ◆ To identify sources of transmission and geographical areas of risk outside of the U.S.
- ◆ To stop transmission from such sources and geographical areas.
- ◆ To identify cases as early as possible to prevent transmission to other persons or animals.
- ◆ To identify cases and clusters of human illness that may be associated with a bioterrorism incident.

B. Laboratory and Health Care Provider Reporting Requirements

VHFs are reportable to the local board of health (LBOH). The MDPH requests that health care providers immediately report to the LBOH in the community where the case is diagnosed, all confirmed or suspect cases of VHF, as defined by the reporting criteria in Section 2A.

Laboratories performing examinations on any specimens derived from Massachusetts residents that yield evidence of VHF infection shall immediately report such evidence of infection, directly by phone, to the MDPH Division of Epidemiology and Immunization at (617) 983-6800 or (888) 658-2850.

C. Local Board of Health (LBOH) Reporting and Follow-Up Responsibilities

Reporting Requirements

MDPH regulations (*105 CMR 300.000*) stipulate that VHFs are reportable to the LBOH and that each LBOH must report any confirmed case of VHF or suspect case of VHF, as defined by the reporting criteria in Section 2A. Cases should be reported to the MDPH Bureau of Communicable Disease Control, Office of Integrated Surveillance and Informatics Services (ISIS) using a MDPH *Generic Confidential Case Report Form* (found at the end of this chapter). Refer to the *Local Board of Health Timeline* at the end of this manual's *Introduction* section for information on prioritization and timeliness requirements of reporting and case investigation.

Case Investigation

If a LBOH learns of a suspect or confirmed case of VHF or of any potential exposure to an agent which could cause VHF, it must call the MDPH Division of Epidemiology and Immunization immediately, any time of the day or night, at (617) 983-6800 or (888) 658-2850.

1. Case investigation of VHF in Massachusetts residents will be directed by the MDPH Division of Epidemiology and Immunization. If bioterrorism is suspected, the MDPH and other response agencies will work closely with LBOH and will provide instruction/information on how to proceed.
2. Following immediate notification of the MDPH, the LBOH may be asked to assist in investigating any case living within their community, including gathering the following information:
 - a. The case's name, age, address, phone number, status (e.g., hospitalized, at home, deceased), and parent/guardian information, if applicable.
 - b. The name and phone number of the hospital where the case is or was hospitalized.
 - c. The name and phone number of the attending physician.
 - d. The name and phone number of the infection control official at the hospital.
 - e. If the patient was seen by a health care provider before hospitalization or seen at more than one hospital, these names and phone numbers.
3. Following immediate notification of the MDPH, the LBOH may be asked to assist in completing an official MDPH *Generic Confidential Case Report Form* (found at the end of this chapter). Most of the information required on the form can be obtained from the health care provider or from the medical record. Use the following guidelines to assist in completing the form:
 - a. Record the case's demographic information.
 - b. Accurately record clinical information including "Viral Hemorrhagic Fever" as the disease being investigated, the type of VHF, if known (e.g., Ebola, Marburg, Lassa, Junin, Machupo, Sabia, Guanarito, Crimean Congo hemorrhagic, or Rift Valley fevers), date of symptom onset, symptoms, whether hospitalized, and hospital and clinician contact information.
 - c. Include all available diagnostic laboratory test information that is available.
 - d. Record information relevant to prevention and control. Use the incubation period range for VHFs (2–16 days, varying by etiologic agent). Specifically, focus on the period beginning a minimum of 2 days prior to the case's onset date back to no more than 16 days before onset for travel history. Determine the date(s) and geographic area(s) of travel to identify where the patient may have become infected.
 - e. Include any additional comments regarding the case.
 - f. If you have made several attempts to obtain case information but have been unsuccessful (e.g., the case or health care provider does not return your calls or respond to a letter, or the case refuses to divulge information or is too ill to be interviewed), please fill out the form with as much information as you have gathered. Please note on the form the reason(s) why it could not be filled out completely.
4. After completing the form, attach laboratory report(s) and fax or mail (in an envelope marked "Confidential") to ISIS. The confidential fax number is (617) 983-6813. Call ISIS at (617) 983-6801 to confirm receipt of your fax. The mailing address is:

MDPH, Office of Integrated Surveillance and Informatics Services (ISIS)
305 South Street, 5th Floor
Jamaica Plain, MA 02130
Fax: (617) 983-6813

5. Institution of disease control measures is an integral part of case investigation. It is the responsibility of the LBOH to understand, and if necessary, institute the control guidelines listed in Section 4.



Section 4:

CONTROLLING FURTHER SPREAD

A. Isolation and Quarantine Requirements (*150 CMR 300.200*)

Minimum Period of Isolation of Patient

Place on hemorrhagic fever-specific barrier precautions with airborne infection isolation, contact, and droplet precautions, and with double gloving and strict hand hygiene, impermeable gowns, face shields, eye protection, and leg and shoe coverings, until clinical illness has resolved.

Minimum Period of Quarantine of Contacts

Personal surveillance (see Section 4B for more information).

B. Protection of Contacts of a Case

There is no immunization or prophylaxis for contacts of cases. Health care workers and other contacts of known or suspect cases of VHF should practice recommended VHF precautions to reduce their chances of acquiring VHF. Individuals who have had any contact with infectious patients should be monitored by their health care provider for the maximum incubation period for the specific agent. Refer to the *Control of Communicable Diseases Manual* (listed in the *References* section at the end of this chapter) for more information.

C. Managing Special Situations

Reported Incidence Is Higher Than Usual/Outbreak Suspected

If the number of reported cases in your city/town is higher than usual or if you suspect an outbreak, the MDPH Division of Epidemiology and Immunization will handle primary investigation. A source of infection, such as travel to a geographical region where a known outbreak of VHF is occurring, should be sought, and applicable preventive or control measures should be instituted. The MDPH Division of Epidemiology and Immunization can determine a course of action to prevent further cases and can perform surveillance for cases across town lines, which would otherwise be difficult to identify at the local level. The LBOH may be asked to assist in the investigation to help determine the source of infection and to implement any necessary control measures.

If a bioterrorism incident is suspected, the MDPH and other response agencies will work closely with the LBOH and will provide instruction/information on how to proceed.

D. Preventive Measures

Environmental Measures

No environmental measures are necessary; VHFs do not occur naturally in Massachusetts. Note that there has been a rare occurrence in other parts of the U.S. (i.e., California arenavirus).

Personal Preventive Measures/Education

To avoid cases of VHFs:

- ◆ Individuals should avoid traveling to areas with known outbreaks of VHFs.
- ◆ Laboratory workers handling specimens suspected of containing the agents of VHF must take appropriate biosafety precautions.
- ◆ Persons working with imported NHPs should know the signs of VHF in NHPs, and they should immediately report any cases of suspect or confirmed VHF in NHPs to the MDPH Division of Epidemiology and Immunization at (617) 983-6800 or (888) 658-2850.

Note: For more information regarding international travel and VHFs, contact the CDC's Traveler's Health Office at (877) 394-8747 or on the CDC website at www.cdc.gov/travel.



ADDITIONAL INFORMATION

There is no formal CDC case definition for VHFs. For reporting to the MDPH, always use the criteria outlined in Section 2A of this chapter.



REFERENCES

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- CDC. Fatal Illness Associated With a New World Arenavirus—California 1999-2000. *MMWR*. August 11, 2000; 49(31).
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FORMS & WORKSHEETS

Viral Hemorrhagic Fevers

Viral Hemorrhagic Fevers

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LBOH Action Steps

This form does not need to be submitted to the MDPH with the case report form. It is for LBOH use and is meant as a quick-reference guide to viral hemorrhagic fever (VHF) case investigation activities.

LBOH staff should follow these steps when VHFs are suspected or confirmed in the community. Also report any exposure to a VHF that may be bioterrorist in nature. For more detailed information, including disease epidemiology, reporting, case investigation and follow-up, refer to the preceding chapter.

Note: Case investigation of VHFs in Massachusetts residents will be directed by the MDPH Division of Epidemiology and Immunization. If a bioterrorist event is suspected, the MDPH and other response authorities will work closely with LBOH and will provide instructions/information on how to proceed.

- ☐ Immediately notify the MDPH Division of Epidemiology and Immunization, at (617) 983-6800 or (888) 658-2850, to report any suspect or confirmed case(s) of a VHF.
- ☐ Obtain laboratory confirmation.
- ☐ Identify other potentially exposed persons.
- ☐ Fill out the case report form (attach laboratory results).
- ☐ Work with MDPH to institute isolation and quarantine requirements (*105 CMR 300.200*), as they apply to a particular case.
- ☐ Send the completed case report form (with laboratory results) to the MDPH Bureau of Communicable Disease Control, Office of Integrated Surveillance and Informatics Services (ISIS).